Please Enter
Edek Clang
3/8/2006

IN THE CLAIMS

Please amend the claims as follows:

1-2. (Cancelled).

3. (Previously Presented) A method for reducing the number of bits of a digital input signal, said method comprising the steps of:

adding a pseudo-random noise signal to the digital input signal to form an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

quantizing the intermediate signal having a word length of n bits to a reduced word-length signal having a word length of m bits, where n and m are integers, n being larger than or equal to m, the quantizing of the intermediate signal including a first transfer function which is non-linear, the first transfer function being defined by non-linear device parameters, a quantization step of the first transfer function for small amplitudes being smaller than a quantization step for large amplitudes,

wherein the gain of the first transfer function is substantially equal to one for small amplitudes, and wherein the gain decreases for large amplitudes,

and wherein the first transfer function equals:

$$M_e/D_i = c_1 \tanh(c_2 D_i + c_3),$$

in which M_e is the reduced word-length signal, D_i is the intermediate signal, and c_1, c_2, c_3 are the non-linear device parameters.

4. (Cancelled).

2 5. (Currently Amended) The method as claimed in claim 1 3, wherein the amplitude of the pseudo-random noise signal is at least equal to a predetermined noise value.

6. (Cancelled).

7. (Cancelled).

3 8. (Currently Amended) ~~The method as claimed in claim 7A~~ method for generating and recording on a recording medium encoded signals from a digital input signal, said method comprising the steps of:

adding a pseudo-random noise signal to the digital input signal to form an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

quantizing the intermediate signal having a word length of n bits to a reduced word-length signal having a word length of m bits, where n and m are integers, n being larger than or equal to

m, the quantizing of the intermediate signal including a first transfer function which is non-linear, the first transfer function being defined by non-linear device parameters, wherein said method further comprises the step of:

recording the reduced word-length signal, the non-linear device parameters and the noise parameters as the encoded signals on a recording medium,

in which the recording medium is a compact disc and the reduced word-length signal is recorded on a first channel, and the non-linear device parameters and the noise parameters are recorded on a second channel, the first channel and second channel being separate channels.

49. (Previously Presented) A method for generating and recording on a recording medium encoded signals from a digital input signal, said method comprising the steps of:

adding a pseudo-random noise signal to the digital input signal to form an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

quantizing the intermediate signal having a word length of n bits to a reduced word-length signal having a word length of m bits, where n and m are integers, n being larger than or equal to m, the quantizing of the intermediate signal including a first

transfer function which is non-linear, the first transfer function being defined by non-linear device parameters,

wherein said method further comprises the steps of:

forming a difference signal, the difference signal being equal to the intermediate signal minus the reduced word-length signal; and

recording the difference signal, the non-linear device parameters and the noise parameters as the encoded signals on a recording medium.

10-11. (Cancelled).

12. (Previously Presented) A signal processing apparatus comprising:

a pseudo-random noise generator for generating a noise signal defined by noise parameters;

an addition element connected to the pseudo-random noise generator for adding the noise signal to a digital input signal thereby forming an intermediate signal; and

a first quantizing element connected to the addition element for transforming the intermediate signal, having a word length of n bits into a reduced word-length signal having a word length of m bits, n and m being integers and n being larger than or equal to m, wherein,

the quantizing element has a non-linear transfer function, the non-linear transfer function being defined by non-linear device parameters, wherein

a quantization step of the non-linear transfer function for small amplitudes being smaller than a quantization step for large amplitudes, the gain of the non-linear transfer function being substantially equal to one for small amplitudes, and the gain decreasing for large amplitudes, and wherein

the non-linear transfer function equals:

$$M_e/D_i = c_1 \tanh(c_2 D_i + c_3),$$

in which M_e is the reduced word-length signal, D_i is the intermediate signal, and c_1, c_2, c_3 are the non-linear device parameters.

13. (Cancelled).

14. (Cancelled).

15. (Cancelled).

16. (Previously Presented) A signal processing apparatus comprising:

means for adding a pseudo-random noise signal to a digital input signal to obtain an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

means for quantizing the intermediate signal, having a word length of n bits, to a reduced word-length signal having a word length of m bits, n and m being integers and n being larger than or equal to m, wherein

the quantizing means includes a first transfer function which is non-linear, the first transfer function being defined by non-linear device parameters, wherein

a quantization step of the first transfer function for small amplitudes being smaller than a quantization step for large amplitudes, the gain of the first transfer function being substantially equal to one for small amplitudes, and wherein the gain decreases for large amplitudes, and wherein

the first transfer function equals:

$$M_e/D_i = c_1 \tanh(c_2 D_i + c_3),$$

in which M_e is the reduced word-length signal, D_i is the intermediate signal, and c_1, c_2, c_3 are the non-linear device parameters.